

Appn. No.: 09/610,269  
Amendment Dated March 15, 2004  
Reply to Office Action of December 15, 2003

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**Remarks/Arguments:**

Applicant's Attorney thanks the examiner and his supervisor for the telephone interview on March 10, 2004.

Claims 1-17 are pending in the above identified application. Claims 1-9 and 17 are rejected.

Claims 1-5, 8 and were rejected under 35 U.S.C. § 103(a) as being unpatentable over Eng et al. This ground for rejection is overcome by the amendments to claims 1 and 17. In particular, Eng does not disclose or suggest,

determining a bandwidth size for the stream of data packets, the bandwidth size being substantially equal to an average bit-rate of the stream of data packets;

determining a bandwidth size for the individually unsolicited periodically allocated grants, the bandwidth size being substantially equal to an average bit-rate of a stream of packets transmitted using the individually unsolicited periodic grants; [and]

determining whether the bandwidth size of the stream of data packets to be transmitted from the at least one remote terminal through the upstream channel is greater than the bandwidth size of the individually unsolicited periodically allocated grant

as required by amended claim 1. Basis for these amendments may be found in the specification at page 2, line 27 through page 3, line 5.

Eng et al. do not disclose or suggest any "individually unsolicited grants" every packet transmission in the Eng et al. system must be in response to the acceptance of a solicited grant request. Furthermore, Eng et al. do not disclose or suggest any step of determining the bandwidth size of either the unsolicited grant requests or the stream of data packets. Instead, Eng et al. determine if there is data left in the buffer after sending a packet in response to a solicited grant request and, if there is, also sending a request for a further grant.

The subject invention represents an advantage over the Eng et al. system because 1) it employs individually unsolicited grants and, thus, does not need to send grant requests on the network to obtain these grants and 2) because it calculates the bandwidth size of both the data stream to be transmitted and the unsolicited periodic grants and only requests dynamically

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allocated grants if the bandwidth size of the data stream is greater than that of the unsolicited grants. Thus, if the data stream is a variable-rate data stream, it may have a bandwidth size that is less than the bandwidth size of the unsolicited periodic grants even though, at any given time, there may be data in the buffer after a packet has been sent in response to an unsolicited periodic grant. The present invention would recognize this condition and not request a dynamically allocated grant. The system described in the Eng patent, however, because it does not 1) disclose or suggest any periodic grants nor any unsolicited periodic grants, 2) determine a bandwidth size of the data it is transmitting or 3) determine a bandwidth size of any unsolicited periodic grants. Accordingly, claim 1 and claims 2-5, 8 and 9 which depend from it are not subject to rejection under 35 U.S.C. § 103(a) as being obvious in view of Eng et al.

Claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Eng et al. and Lakshaman. Eng et al. is described above. Lakshaman, like Eng et al. does not disclose or suggest individually unsolicited periodic grants. According to Lakshaman, a data source must request a certain bandwidth the system then uses a feedback system to allocate grants based on queue size. Because these grants are allocated in response to this feedback system, they can not be periodic. Furthermore, because they are allocated in response to a request from the data source, they can not be individually unsolicited. Accordingly, Lakshaman does not provide the material that is missing from Eng et al. Consequently, claim 1 is not subject to rejection under 35 U.S.C. § 103(a) in view of Eng et al. and Lakshaman and claims 6 and 7 which depend from claim 1 can not be subject to rejection under 35 U.S.C. § 103(a) in view of Eng et al. and Lakshaman.

Claim 17 was rejected under 35 U.S.C. § 112, first paragraph. In the Office Action, the Examiner asserts that 1) "[t]he specification does not clearly describe how the measurement-based dynamic UGPRS unsolicited channel allocation is calculated. Referring to Fig. 9, step 8, it is not sufficiently described how the new UGS grant size is calculated using the increase and decrease constants obtained in steps 6 and 7;" and 2) "the claim's reference to 'at least two predetermined thresholds' is not consistent with Fig. 9 where only one threshold is shown." Applicants respectfully disagree with both of these assertions.

With respect to the first assertion, claim 17 as amended in response to the previous Office Action, includes three steps:

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determining an average bandwidth size of an unused portion of the periodically allocated grant;

determining an average bandwidth size of requested dynamically allocated grants; and

adjusting the bandwidth size of the periodically allocated grant based on the measured sizes and at least one predetermined threshold.

As described at page 2, lines 30 and 31, the bandwidth size of a data stream is "substantially equal to the average bit-rate of the stream of packets." It follows from this that the bandwidth size of the unused portion of the periodically allocated grant is substantially equal to the average bit-rate represented by the unused portion of the periodically allocated grant, that is to say, the average bit rate of a bit-stream that would completely fill the unused portion of the periodically allocated grant. (See also, page 13, lines 1-5) In the same way, in the second step, the "average bandwidth size of requested dynamically allocated grants" is substantially equal to the average bit-rate of a data stream that is represented by all of the requested dynamically allocated grants. (See page 13, lines 5-7, note that at page 8, "rtPS" is defined as being equivalent to "dynamically allocated grants"). Because this the "average size" of the dynamically allocated grants, it is bandwidth that could be added to the periodically allocated grants. It cannot, however, be directly added but, instead, is added only to the used portion of the bandwidth of the periodically allocated grants.

The third step, "adjusting the bandwidth size of the periodically allocated grant based on the measured sizes and at least one predetermined threshold" implements this adjustment and is described, on page 13 at lines 7-16 of the originally filed application:

In step 5 the average number of unused UGS bytes is compared to a predetermined threshold, if greater than the threshold. For the next window the number of bytes times the rate decrease constant (chosen between 0 and 1) is subtracted from the unsolicited allocation in step 6. At the same time, the average number of bytes transmitted over the piggyback request channel portion times the rate increase constant is added to the unsolicited allocation in step 7. Thus, in step 8, the two constants (increase and decrease) control how fast the unsolicited allocation tracks the changes in the dynamic bandwidth requirements of a video stream. The inventors have determined the rate decrease constant of 0.5 and the rate increase constant of 1.0 provide for an acceptable "dynamic" UGPRS performance.

Applicants note that there is an obvious punctuation error in this passage that may have caused confusion. This error is corrected by the enclosed amendment to the specification. In

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particular, lines 2 and 3 above should read. "predetermined threshold. If the average number of unused UGS bytes is greater than the threshold then, for the next window, the number of bytes times the rate decrease constant (chosen between 0 and 1) is"

As set forth in this passage, the exemplary embodiment of this step includes three calculations. First, the average number of unused UGS bytes is compared to a threshold. This average number of bytes is the bandwidth size of the unused portion of the periodically allocated grant (note that at page 7, line 16, "UGS" is defined as being equivalent to "periodically allocated grants.") Next, if the average number of unused UGS bytes is greater than the threshold, a quantity, equal to the [average] number of [unused] bytes times a "rate decrease constant", is subtracted from the unsolicited [bandwidth size] allocation. This calculation reduces the bandwidth of the unsolicited grants to the minimum bandwidth appropriate for the average number of unsolicited packets that were actually sent. At the same time, a quantity, equal to the average bandwidth size of the dynamically allocated grants times a rate increase constant, is added to the unsolicited [bandwidth size] allocation. This step increases the unsolicited grant bandwidth to subsume the average bandwidth of the dynamically allocated grants. Exemplary values are given for the rate decrease constant and the rate increase constant. The only value not provided is the threshold. This, however, may be determined by one of ordinary skill in the art without undue experimentation. In addition, the interval over which the average values are determined may be readily derived by the skilled person without undue experimentation. Thus, Applicants assert that this claim is adequately described in the specification to enable one of ordinary skill in the art to practice the invention without undue experimentation.

As for the second assertion, it appears that the Examiner is in error. Claim 17, as amended recites "at least one threshold," not "at least two thresholds" as asserted in the Office Action.

Consequently, claim 17 is not subject to rejection under 35 U.S.C. § 112, first paragraph.

Applicants gratefully acknowledge the statement in the Office Action that claims 10-16 are allowed.

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In view of the foregoing amendments and remarks Applicants request that the Examiner reconsider and withdraw the rejection of claims 1-5, 8, 9 and 17.

Respectfully submitted,

  
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